

MODEL	FPA-3000 i4	INSTALLATION CHECK LIST	
SN		START DATE	
CUSTOMER		END DATE	

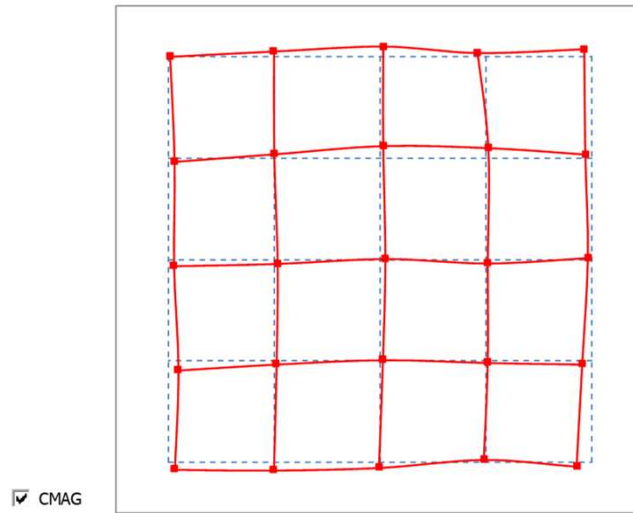
	DESCRIPTION		Results	UNIT	SPECIFICATION
LENS/IMAGING	Resolution		0.35	μm	0.35
	CD Uniformity	R (BF)		μm	NA
	Depth of focus			μm	≥ 0.7
	Image Field Deviation			μm	≤ 0.40
	LENS DISTORTION (Normal)	DX	0.049	μm	≤ ± 0.06
		DY	0.041		
ILLUMINATION SYSTEM	Standard/Normal Illumination	Uniformity	1.47	%	≤ 1.5
		Intensity	8857.0	W/m ²	≥ 5500
	L.I. ACCURACY		0.17	%	≤ 1.0
	MASKING BLADE ACCURACY	θ	1410.5	ppm	≤ 3000
		GZW	25	μm	≤ 60
		Total	105	μm	≤ ± 110
FOCUS TILT SYSTEM	FOCUS - TILT STABILITY	F(3σ)	0.040	μm	3σ ≤ 0.08
		X(3σ)	4.0	ppm	3σ ≤ 6
		Y(3σ)	4.5		
	FOCUS - TILT REPEATABILITY	F(3σ)	0.060	μm	3σ ≤ 0.10
		X(3σ)	4.4	ppm	3σ ≤ 7
		Y(3σ)	5.0		
	GLOBAL - TILT MEASUREMENT REPEATABILITY	X(3σ)	0.4	ppm	3σ ≤ 4
		Y(3σ)	0.5		
	GLOBAL - TILT ACCURACY	X(3σ)	0.7	ppm	3σ ≤ 8
		Y(3σ)	0.9		
	TILT SENSOR UNEVEN FOCUS (DxD ON)	V	2.7	ppm	≤ ± 4
	UNEVEN FOCUS (TSOC) (DxD OFF)	V	1.2	ppm	≤ ± 6
	ALFC MEASUREMENT REPEATABILITY	3σ	0.03	μm	3σ ≤ 0.10
TVPA	TV PRE-ALIGNMENT ACCURACY (DARK FIELD)	X	1.14	μm	≤ 3.0
		Y	1.10		
WAFER STAGE	XYSA	Ortho	0.03	ppm	≤ ± 0.5
		Scal X	0.05		
		Scal Y	-0.08		
	STEPPING ACCURACY	XX (3σ)	0.0393	μm	3σ ≤ 0.040
		YY(3σ)	0.0180		
	STEPPING REPEATABILITY	X(3σ)	0.0300	μm	3σ ≤ 0.035
		Y(3σ)	0.0264		
SRC	SRC MEASUREMENT REPEATABILITY	3σ	0.27	ppm	3σ ≤ 0.5

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RETICLE ALIGNMENT	ROC MEASUREMENT REPEATABILITY		XL(3 σ)	0.005	μm	$3\sigma \leq 0.01$
			YL(3 σ)	0.001		
			XR(3 σ)	0.005		
			YR(3 σ)	0.001		
	RETICLE ROTATION ACCUARACY			0.001	μm	$\leq \pm 0.01$
	RETICLE ROTATION REPEATABILITY			0.008	μm	$\leq \pm 0.02$
B & C SCOPE OAS	B/C SCOPE DEFOCUS CHARATERISTICS	B/S	X-Ka	-10	mrad	$\leq \pm 20$
			X-Kb	-5		
			X-Kc	-2		
		C/S	Y-Ka	1		
			Y-Kb	-2		
			Y-Kc	2		
	B/C SCOPE TOC MEASUREMENT REPEATABILITY	B/S	X	0.014	μm	$3\sigma \leq 0.02$
		C/S	Y	0.015		
BASELINE	BLCC STABILITY (MODE 1)		X(3 σ)	0.009	μm	$3\sigma \leq 0.030$
			Y(3 σ)	0.007		
			RNG(X)	0.012	μm	Range ≤ 0.030
			RNG (Y)	0.010		
	BLCC STABILITY (MODE 3)		X(3 σ)	0.006	μm	$3\sigma \leq 0.030$
			Y(3 σ)	0.006		
			RNG(X)	0.008	μm	Range ≤ 0.030
			RNG (Y)	0.009		
AUTO ALIGNMENT	AGA ACCURACY MODE 1 ($ m + 3\sigma$)		X	0.041	μm	$ \text{mean} + 3\sigma \leq 0.06$
			Y	0.053		
	AGA ACCURACY MODE 3 ($ m + 3\sigma$)		X	0.043	μm	$ \text{mean} + 3\sigma \leq 0.06$
			Y	0.021		
	Mech TV PRE-ALIGNMENT ACCURACY		XL	15.7	μm	$3\sigma \leq 40$
			XR	17.7		
			YL	18.3		
			YR	17.1		
TPD	THROUGHPUT 6" WAFER TYPE-L WF		DxD ON	80.1	WPH	≥ 70
	WAFER CHUCK FLATNESS step size 5x5		TTV	0.99	μm	≤ 2.0
			LTV	0.53	μm	≤ 0.60
	Wafer Transfer			No		No Error
	Reticle Transfer			No		No Error
Exposure History	Exposure Focus Stability		Focus Range	0.10	μm	≤ 0.4 (Reference)
	Exposure Magnification Stability		Mag Range	0.5	ppm	≤ 2 (Reference)

Distortion

MODEL	FPA-3000 i4	ITEM	LENS DISTORTION (Normal)		
SN		ENGR	Cut	SPEC	dX&dY < ± 0.06
CUSTOMER		DATE			



PITCH X 5.247 mm PITCH Y 5.247 mm

X (Mag Excluded)

	-10.494	-5.247	0	5.247	10.494
10.494	0.004	-0.002	0.010	-0.027	-0.024
5.247	0.019	-0.001	0.010	0.009	-0.020
0	0.017	0.010	0.017	0.007	-0.012
-5.247	0.032	0.007	0.009	0.006	-0.031
-10.494	0.020	-0.002	-0.004	-0.006	-0.049

Y (Mag Excluded)

	-10.494	-5.247	0	5.247	10.494
10.494	-0.001	0.018	0.035	0.012	0.026
5.247	-0.013	0.013	0.041	0.034	0.012
0	-0.023	-0.015	0.002	-0.013	0.006
-5.247	-0.032	-0.012	0.003	-0.006	-0.012
-10.494	-0.025	-0.027	-0.018	0.009	-0.014

MAX X 0.032 μm
 MIN X -0.049 μm
 MAX Y 0.041 μm
 MIN Y -0.032 μm

dX	0.049 um (Mag Excluded)
dY	0.041 um (Mag Excluded)

MODEL	FPA-3000 i4	ITEM	Standard/Normal Illumination			
SN		ENGR	Cut	SPEC	Uniformity ≤ 1.5% Intensity ≥ 5500	
CUSTOMER		DATE				

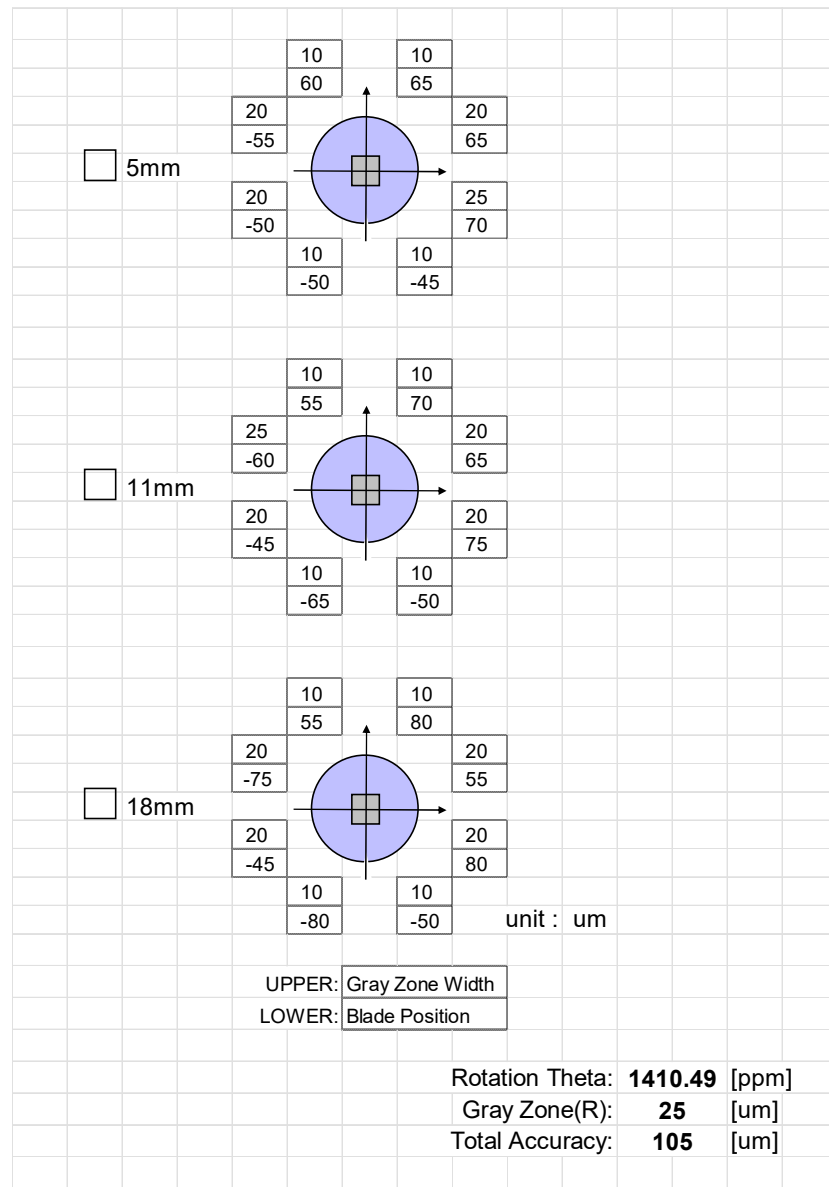
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	99.3	100.4	100.8	101.2	101.4	101.4	101.5	101.6	101.6	101.6	101.6	101.7	101.8	101.8	101.8	101.9	101.8	101.8	101.4	101.0	100.3
2	100.2	100.9	101.3	101.5	101.7	101.6	101.6	101.6	101.5	101.4	101.4	101.6	101.6	101.7	101.8	101.9	102.0	102.1	101.9	101.6	101.0
3	100.8	101.5	101.8	101.8	101.8	101.7	101.6	101.5	101.4	101.3	101.2	101.2	101.4	101.5	101.6	101.8	102.1	102.3	102.3	102.1	101.7
4	101.4	101.9	102.0	101.9	101.7	101.5	101.3	101.2	101.1	101.0	101.0	101.0	101.1	101.2	101.3	101.7	101.9	102.3	102.4	102.4	102.1
5	101.9	102.2	102.1	101.8	101.6	101.4	101.1	101.0	100.9	100.8	100.8	100.9	101.0	101.0	101.2	101.5	101.8	102.3	102.5	102.7	102.4
6	102.3	102.5	102.2	101.8	101.5	101.2	101.0	100.8	100.8	100.7	100.8	100.8	100.9	101.0	101.2	101.3	101.7	102.2	102.6	102.8	102.7
7	102.7	102.9	102.1	101.7	101.3	101.0	100.8	100.7	100.7	100.8	100.8	100.8	100.9	100.9	101.0	101.2	101.5	102.1	102.5	102.9	102.8
8	102.8	102.9	102.2	101.7	101.2	100.9	100.7	100.7	100.8	100.7	100.7	100.8	100.8	100.9	101.0	101.1	101.4	101.9	102.4	102.9	102.9
9	102.8	103.0	102.1	101.5	101.1	100.8	100.7	100.7	100.6	100.5	100.4	100.5	100.8	100.9	100.9	101.0	101.3	101.7	102.3	102.8	102.9
10	102.8	102.9	102.0	101.4	101.0	100.7	100.6	100.5	100.4	100.2	100.2	100.3	100.5	100.8	100.9	100.9	101.1	101.6	102.2	102.7	102.9
11	102.8	102.9	101.9	101.3	100.8	100.6	100.4	100.4	100.3	100.1	100.0	100.2	100.4	100.7	100.8	100.8	101.1	101.5	102.2	102.7	102.9
12	102.9	102.9	101.9	101.3	100.8	100.5	100.4	100.4	100.3	100.2	100.1	100.2	100.5	100.7	100.8	100.9	101.1	101.6	102.2	102.7	102.9
13	102.9	102.9	102.0	101.4	101.0	100.6	100.4	100.4	100.4	100.3	100.2	100.4	100.6	100.7	100.8	100.9	101.2	101.7	102.3	102.7	102.8
14	102.8	102.9	101.9	101.4	101.0	100.6	100.4	100.3	100.3	100.3	100.4	100.5	100.6	100.6	100.7	101.0	101.4	101.9	102.3	102.7	102.8
15	102.7	102.8	102.0	101.5	101.1	100.7	100.4	100.3	100.2	100.3	100.4	100.4	100.4	100.5	100.7	101.0	101.4	101.9	102.3	102.6	102.6
16	102.4	102.6	101.9	101.5	101.1	100.8	100.5	100.4	100.2	100.2	100.2	100.3	100.4	100.6	100.7	101.1	101.6	102.0	102.3	102.5	102.4
17	101.9	102.2	101.7	101.5	101.2	100.9	100.6	100.4	100.3	100.2	100.2	100.3	100.5	100.7	100.9	101.3	101.6	102.0	102.2	102.3	102.1
18	101.2	101.6	101.6	101.5	101.2	100.9	100.7	100.5	100.3	100.2	100.4	100.5	100.7	100.9	101.2	101.4	101.7	102.0	102.1	102.1	101.7
19	100.6	101.2	101.4	101.3	101.2	101.0	100.9	100.5	100.3	100.2	100.7	100.8	100.9	101.1	101.3	101.6	101.7	101.9	101.8	101.7	101.2
20	100.0	100.7	101.0	101.1	101.1	101.1	101.0	100.8	100.7	100.7	100.9	101.0	101.1	101.3	101.4	101.6	101.6	101.5	101.4	101.2	100.5
21	99.2	100.1	100.6	100.9	101.0	101.1	101.1	101.1	101.1	101.2	101.2	101.3	101.4	101.5	101.5	101.5	101.5	101.3	101.1	100.7	99.8

Area 22 x 22
Uniformity: 1.47 %
Intensity Li: 8990.0
Intensity Uc: 8857.0

MODEL	FPA-3000 i4	ITEM	L.I. ACCURACY		
SN		ENGR	Cut	SPEC	< 1.0
CUSTOMER		DATE			

			<i>Intensity:</i>	8243	(J/m2)				
<i>SETTING TIME</i>	<i>Energy</i>		<i>MAX</i>	<i>MIn</i>	<i>Ave.</i>	<i>Repeat</i>	<i>Set Error</i>	<i>Linearity</i>	
100	824.3 (J/m2)		825.0	823.0	824.1	0.121	-0.030		
200	1648.6 (J/m2)		1647.5	1646.0	1646.9	0.046	-0.103	0.04	
500	4121.5 (J/m2)		4121.5	4119.0	4120.6	0.030	-0.022		
1000	8243.0 (J/m2)		8243.0	8239.5	8241.9	0.021	-0.013		
			<i>Total Accuracy :</i>	0.17	(%)				

MODEL	FPA-3000 i4	ITEM	MASKING BLADE ACCURACY		
SN		ENGR	Cut	SPEC	q ≤ 3000 GZW < 60um Total < 110um
CUSTOMER		DATE			



MODEL	FPA-3000 i4	ITEM	FOCUS - TILT STABILITY		
SN		ENGR	Cut	SPEC	Focus $3\sigma \leq 0.08\mu\text{m}$ Tilt X&Y $3s < 6\text{ppm}$
CUSTOMER		DATE			

Data#	Z um	X ppm	Y ppm	C1m um	C2m um	C3 um	C4m um	C5m um
1	0.06	28.7	20.6	-0.03	0.48	0.09	-0.34	0.09
2	0.05	29.8	15.9	-0.08	0.41	0.13	-0.35	0.14
3	0.08	26.2	17.4	-0.03	0.43	0.17	-0.3	0.11
4	0.05	29.5	17.2	-0.1	0.43	0.17	-0.35	0.09
5	0.06	25.8	18.2	0	0.4	0.12	-0.33	0.12
6	0.07	27	17	-0.06	0.44	0.17	-0.29	0.09
7	0.08	32.7	21	-0.09	0.54	0.2	-0.35	0.09
8	0.05	29.1	17.5	-0.08	0.44	0.14	-0.34	0.1
9	0.08	27.9	13.5	-0.06	0.42	0.15	-0.27	0.17
10	0.07	29.1	15.3	-0.08	0.43	0.16	-0.31	0.14
11	0.07	27.6	18	-0.06	0.45	0.17	-0.31	0.08
12	0.04	29.5	16.5	-0.1	0.43	0.14	-0.34	0.1
13	0.06	28.4	16.8	-0.08	0.44	0.15	-0.32	0.1
14	0.06	28.3	17.3	-0.09	0.45	0.16	-0.31	0.08
15	0.04	28.1	16.9	-0.09	0.42	0.13	-0.33	0.08
16	0.06	27.6	17	-0.08	0.44	0.14	-0.31	0.09
17	0.09	27.8	16.9	-0.04	0.45	0.19	-0.3	0.13
18	0.06	28	18.3	-0.05	0.44	0.15	-0.33	0.1
19	0.06	29	17	-0.08	0.44	0.15	-0.33	0.1
20	0.07	28.6	17.4	-0.08	0.46	0.16	-0.31	0.09
21	0.08	27.8	15	-0.06	0.45	0.15	-0.26	0.14
22	0.04	29	17.7	-0.08	0.42	0.13	-0.36	0.1
23	0.06	26.8	17.8	-0.04	0.44	0.12	-0.31	0.09
24	0.06	27.9	16.7	-0.07	0.44	0.15	-0.31	0.1
25	0.05	27.9	17.7	-0.09	0.44	0.16	-0.32	0.07
Max	0.09	32.7	21	0	0.54	0.2	-0.26	0.17
Min.	0.04	25.8	13.5	-0.1	0.4	0.09	-0.36	0.07
Mean	0.06	28.3	17.2	-0.07	0.44	0.15	-0.32	0.1
Count	25	25	25	25	25	25	25	25
Range	0.04	6.9	7.5	0.1	0.14	0.11	0.1	0.1
3-S	0.0398	4.0	4.4	0.073	0.077	0.068	0.072	0.07

MODEL	FPA-3000 i4	ITEM	FOCUS - TILT REPEATABILITY		
SN		ENGR	Cut	SPEC	Focus $3\sigma \leq 0.10\mu\text{m}$ Tilt X&Y $3\sigma < 7\text{ppm}$
CUSTOMER		DATE			

Shot #	CH-1	CH-2	CH-3	CH-4	CH-5	Z (um)	X(ppm)	Y(ppm)
1	0.01	0.02	-0.08	0.01	-0.03	-0.014	-1.25	1.28
2	0.01	0.05	-0.07	0.02	0.01	0.006	0.91	0.73
3	-0.04	0.02	0.12	0	0.02	0.024	2.34	-0.81
4	0.04	0.03	-0.05	0	0.06	0.015	1.39	0.53
5	-0.01	-0.01	0.01	0	-0.09	-0.02	-2.8	2.23
6	0.04	-0.04	-0.08	-0.04	0.02	-0.021	-0.7	0.61
7	0.03	0.03	0.04	0.04	0.08	0.043	1.63	-1.73
8	0	-0.01	0.03	0.01	-0.01	0.005	-0.65	-0.01
9	0.05	0	-0.01	0.05	0.08	0.032	-0.55	-2.28
10	0	0.02	0.07	-0.03	0.04	0.02	2.42	0.21
11	0.03	-0.01	0.05	-0.02	0.06	0.024	1.44	-0.51
12	0.02	-0.06	0.01	-0.05	0.06	-0.004	1.35	-1.45
13	-0.01	0.03	0.01	-0.03	-0.01	-0.002	1.68	1.8
14	0.03	0.03	-0.01	0.01	0.03	0.017	0.72	0.58
15	-0.01	0.03	-0.01	-0.01	-0.02	-0.003	0.8	1.54
16	0.07	0.05	-0.07	0	0.03	0.016	0.4	2.71
17	0.03	-0.05	-0.03	0.02	0.04	0.002	-1.87	-2.24
18	0.01	0.05	-0.05	0.03	0.02	0.013	0.92	0.21
19	0.03	0.01	0.07	0.01	0.06	0.037	0.95	-0.88
20	0	-0.03	0.04	-0.02	0	-0.001	-0.29	-0.14
21	-0.03	0.06	0.02	0.03	-0.01	0.014	1.59	0.6
22	-0.03	-0.02	0.05	0.01	-0.03	-0.005	-0.92	-1.09
23	0.08	0.07	-0.04	0.08	88.88	0.034	-2.67	2.19
24	0.01	-0.01	-0.04	88.88	88.88	-0.043	-1.11	4.94
				3-sigma		0.060	4.4	5.0

MODEL	FPA-3000 i4	ITEM	GLOBAL - TILT REPEATABILITY		
SN		ENGR	Cut	SPEC	Tilt X & Y $3\sigma \leq 4$
CUSTOMER		DATE			

<<Measure>>

*** GLOBAL-TILT-OFFSET AUTO-MEASUREMENT ***

Data #	X(ppm)	Y(ppm)
1	-0.117	0.316
2	-0.221	-0.08
3	-0.111	0.376
4	-0.047	0.387
5	0.035	0.219
6	0.008	0.28
7	-0.058	0.351
8	-0.132	-0.137
9	0.073	0.337
10	-0.142	0.049
11	-0.039	0.258
12	0.038	0.389
13	-0.03	0.253
14	-0.169	-0.082
15	0.008	0.015
16	-0.394	0.024
17	-0.119	-0.15
18	0.233	-0.15
19	-0.194	0.072
20	-0.178	0.115
21	0.315	0.294
22	0.163	0.215
23	-0.014	0.345
24	-0.044	0.225
25	-0.039	0.046
Max.	0.315	0.389
Min.	-0.394	-0.15
Mean	-0.047	0.159
Count	25	25
Range	0.708	0.539
3-S	0.4	0.5

MODEL	FPA-3000 i4	ITEM	GLOBAL - TILT ACCURACY		
SN		ENGR	Cut	SPEC	Tilt X & Y $3\sigma \leq 8$
CUSTOMER		DATE			

DRIVE		COMPENSATED	
TILT X	TILT Y	TILT X	TILT Y
50	50	0.048	-0.307
50	0	0.386	-0.361
50	-50	-0.148	0.011
-50	50	-0.054	-0.338
-50	0	0.019	0.135
-50	-50	0.206	0.449
0	50	0.413	0.103
0	-50	0.052	-0.069
50	50	-0.096	0.173
50	0	0.157	-0.469
50	-50	-0.216	0.129
-50	50	-0.073	0.350
-50	0	0.220	0.401
-50	-50	0.375	0.346
0	50	0.025	0.025
0	-50	-0.350	-0.416
3σ		0.66	0.92

MODEL	FPA-3000 i4	ITEM	UNEVEN FOCUS (DxD ON)		
SN		ENGR	Cut	SPEC	V < ± 4 ppm
CUSTOMER		DATE			

Die by Die (Tilt ON)

span(mm) =

22

Wafer Data
Entry

(Neg) (Pos)

UL	-0.45		
UC	0		
UR	0.05		
ML	-0.25		
MR	-0.15		
LL	0		
LC	-0.05		
LR	-0.45		

Results

SPEC

X Tilt: -2.3 ppm

< 4 ppm

Y Tilt: -1.5 ppm

< 4 ppm

V

2.7

< 4 ppm

MODEL	FPA-3000 i4	ITEM	UNEVEN FOCUS (DxD OFF)		
SN		ENGR	Cut	SPEC	V < ± 6ppm
CUSTOMER		DATE			

Uneven Focus (Tilt OFF)

TSOC Data

X0	1.125
Y0	-0.25
X180	
Y180	

Results

SPEC

X Tilt: 1.13 ppm < 4 ppm

Y Tilt: -0.25 ppm < 4 ppm

V 1.15 < 6 ppm

MODEL	FPA-3000 i4	ITEM	ALFC MEASUREMENT REPEATABILITY		
SN		ENGR	Cut	SPEC	$3\sigma \leq 0.10$
CUSTOMER		DATE			

Advanced Lens Focus Check (LEFT)

1 0.202 [um]
 2 0.198 [um]
 3 0.208 [um]
 4 0.217 [um]
 5 0.215 [um]
 6 0.190 [um]
 7 0.211 [um]
 8 0.192 [um]
 9 0.205 [um]
 10 0.195 [um]
 11 0.202 [um]
 12 0.202 [um]
 13 0.212 [um]
 14 0.218 [um]
 15 0.219 [um]
 16 0.193 [um]
 17 0.206 [um]
 18 0.217 [um]
 19 0.189 [um]
 20 0.199 [um]
 21 0.207 [um]
 22 0.192 [um]
 23 0.210 [um]
 24 0.212 [um]
 25 0.220 [um]

EFFICIENT DATA COUNT: 25

MAX: 0.220 [um]
 MIN: 0.189 [um]
 RANGE: 0.031 [um]
 AVERAGE: 0.205 [um]
3-SIGMA: 0.029 [um]

MODEL	FPA-3000 i4	ITEM	TVPA ACCURACY		
SN		ENGR	Cut	SPEC	X & Y < ± 3um
CUSTOMER		DATE			

```

No = 3 X = -0.296 Y = -1.010 Cmag = -0.042 Crot = 0.019 sts =OK
No = 1 X = -0.021 Y = 0.017 Cmag = -0.033 Crot = 0.016 sts =OK
No = 1 X = -0.356 Y = -0.912 Cmag = -0.042 Crot = 0.021 sts =OK
No = 2 X = -0.306 Y = -0.914 Cmag = -0.034 Crot = -0.002 sts =OK
No = 3 X = -0.329 Y = -0.848 Cmag = -0.038 Crot = -0.008 sts =OK
No = 1 X = -0.011 Y = 0.025 Cmag = -0.035 Crot = 0.027 sts =OK
***** TvpaHelp V6.0 *****

```

torikomishotsuu: 100

```

Ave: X = 0.590 Y = -0.703
3sigma: X = 2.306 Y = 1.268 |
max: Xmax = 1.426 Ymax = 1.058

```

```

Xmax + Crotmax = 1.473
Ymax + Crotmax = 1.105

```


MODEL	FPA-3000 i4	ITEM	STEPPING REPEATABILITY		
SN		ENGR	Cut	SPEC	X&Y $3\sigma \leq 0.035$
CUSTOMER		DATE			

shot	x	y
1	0.007	-0.022
2	-0.001	-0.027
3	-0.017	-0.012
4	0.001	-0.012
5	0.006	-0.019
6	0.001	-0.033
7	-0.006	-0.022
8	-0.011	-0.015
9	-0.014	-0.012
10	0.007	-0.02
11	0.002	-0.029
12	0.003	-0.017
13	-0.006	-0.029
14	-0.001	-0.035
15	-0.006	-0.017
16	-0.036	-0.02
17	-0.006	-0.017
18	0.006	-0.013
19	-0.012	-0.027
20	-0.003	-0.017
21	-0.023	-0.027
22	-0.005	-0.047
23	-0.017	-0.031
24	-0.026	-0.039
25	-0.025	-0.028
26	0.001	-0.022
27	-0.002	-0.023
28	-0.012	-0.031
29	-0.019	-0.034
30	-0.009	-0.035
31	-0.013	-0.025
32	-0.028	-0.024
33	-0.015	-0.022
34	-0.001	-0.022
35	-0.02	-0.004
36	-0.018	-0.034
37	-0.012	-0.026
38	-0.005	-0.033
39	-0.016	-0.029
40	-0.005	-0.033
41	-0.006	-0.027
42	-0.007	-0.022
43	-0.025	-0.026
44	-0.004	-0.024
45	-0.01	-0.031
46	-0.002	-0.05
47	-0.003	-0.039
48	-0.003	-0.031
49	-0.017	-0.039
50	-0.025	-0.026
51	-0.021	-0.023
52	-0.006	-0.023
3-Sigma	0.0300	0.0264

MODEL	FPA-3000 i4	ITEM	STEPPING ACCURACY		
SN		ENGR	Cut	SPEC	XX & YY $3\sigma \leq 0.04$
CUSTOMER		DATE			

Shot	X-X	Y-Y
1	-0.021	0.009
2	-0.003	0.006
3	-0.007	0.011
4	-0.031	0.003
5	-0.049	-0.004
6	0.006	0.002
7	0.004	0.002
8	-0.013	0.001
9	-0.011	0.002
10	-0.008	-0.006
11	-0.002	0.006
12	-0.014	0.006
13	-0.02	-0.002
14	-0.018	0.004
15	-0.01	0.005
16	-0.02	0.005
17	-0.009	0.012
18	-0.014	0.01
19	-0.024	-0.006
20	-0.018	-0.001
21	-0.046	0.002
22	-0.023	0.011
23	-0.041	-0.001
24	-0.033	-0.009
25	-0.037	-0.001
26	0.006	-0.004
27	-0.013	0.003
28	-0.018	-0.001
29	-0.034	-0.002
30	-0.032	0.003
31	-0.025	0.001
32	-0.012	0.009
33	-0.019	-0.014
34	-0.02	-0.003
35	0.006	-0.001
36	-0.014	-0.001
37	-0.022	-0.011
38	-0.028	0.012
39	-0.032	0.005
40	-0.049	0
41	-0.018	0.006
42	-0.02	0
43	-0.015	-0.011
44	-0.019	-0.008
45	-0.014	-0.008
46	-0.009	-0.008
47	0	-0.008
48	-0.017	-0.003
49	-0.023	0
50	-0.03	0.005
51	-0.023	0.001
52	0.003	0.003
53	-0.011	0
54	-0.004	-0.006
55	-0.014	-0.004
56	-0.021	-0.002
57	-0.018	-0.002
58	-0.016	0.013
59	-0.013	-0.002
60	-0.025	0.001
61	-0.029	-0.005

Shot	X-X	Y-Y
62	-0.013	0.009
63	-0.048	-0.004
64	-0.011	0.006
65	-0.009	0.007
66	-0.022	-0.004
67	-0.006	-0.006
68	-0.023	0.003
69	-0.021	0.004
70	-0.052	0.005
3-Sigma	0.0393	0.0180

MODEL	FPA-3000 i4	ITEM	SRC MEASUREMENT REPEATABILITY		
SN		ENGR	Cut	SPEC	$3\sigma \leq 0.5\mu\text{m}$
CUSTOMER		DATE			

1	Rot. = -0.090	Mag. = -16.828 [ppm]
2	Rot. = -0.241	Mag. = -16.702 [ppm]
3	Rot. = -0.240	Mag. = -16.706 [ppm]
4	Rot. = -0.003	Mag. = -16.561 [ppm]
5	Rot. = -0.316	Mag. = -16.534 [ppm]
6	Rot. = 0.017	Mag. = -16.767 [ppm]
7	Rot. = -0.274	Mag. = -16.718 [ppm]
8	Rot. = -0.194	Mag. = -16.645 [ppm]
9	Rot. = -0.078	Mag. = -16.588 [ppm]
10	Rot. = -0.193	Mag. = -16.702 [ppm]
11	Rot. = -0.279	Mag. = -16.641 [ppm]
12	Rot. = -0.124	Mag. = -16.580 [ppm]
13	Rot. = -0.036	Mag. = -16.424 [ppm]
14	Rot. = -0.063	Mag. = -16.427 [ppm]
15	Rot. = -0.223	Mag. = -16.664 [ppm]
16	Rot. = -0.158	Mag. = -16.454 [ppm]
17	Rot. = -0.165	Mag. = -16.595 [ppm]
18	Rot. = -0.203	Mag. = -16.466 [ppm]
19	Rot. = -0.074	Mag. = -16.393 [ppm]
20	Rot. = -0.183	Mag. = -16.416 [ppm]
21	Rot. = -0.039	Mag. = -16.580 [ppm]
22	Rot. = -0.049	Mag. = -16.363 [ppm]
23	Rot. = -0.102	Mag. = -16.466 [ppm]
24	Rot. = -0.137	Mag. = -16.508 [ppm]
25	Rot. = -0.222	Mag. = -16.282 [ppm]
Available Data 25 Measurement Span 26.200 [mm]		
Mean :	Rot. = -0.147	Mag. = -16.560 [ppm]
3Sigma :	Rot. = 0.271	Mag. = 0.408 [ppm]
Max :	Rot. = 0.017	Mag. = -16.282 [ppm]
Min :	Rot. = -0.316	Mag. = -16.828 [ppm]
Range :	Rot. = 0.333	Mag. = 0.546 [ppm]

MODEL	FPA-3000 i4	ITEM	ROC MEASUREMENT REP		
SN		ENGR	Cut	SPEC	3 σ $\leq$ 0.01 μ m
CUSTOMER		DATE			

Reticle Offset Check

1 XL=-0.207 YL= 0.000 XR=-0.039 YR= 0.008 [μ m]
 2 XL=-0.206 YL= 0.000 XR=-0.037 YR= 0.008 [μ m]
 3 XL=-0.203 YL= 0.001 XR=-0.036 YR= 0.008 [μ m]
 4 XL=-0.208 YL= 0.000 XR=-0.040 YR= 0.008 [μ m]
 5 XL=-0.208 YL= 0.001 XR=-0.039 YR= 0.008 [μ m]
 6 XL=-0.210 YL= 0.000 XR=-0.042 YR= 0.008 [μ m]
 7 XL=-0.207 YL= 0.001 XR=-0.040 YR= 0.008 [μ m]
 8 XL=-0.207 YL= 0.001 XR=-0.039 YR= 0.008 [μ m]
 9 XL=-0.208 YL= 0.001 XR=-0.042 YR= 0.008 [μ m]
 10 XL=-0.209 YL= 0.001 XR=-0.041 YR= 0.007 [μ m]
 11 XL=-0.209 YL= 0.001 XR=-0.040 YR= 0.008 [μ m]
 12 XL=-0.206 YL= 0.001 XR=-0.038 YR= 0.008 [μ m]
 13 XL=-0.206 YL= 0.001 XR=-0.039 YR= 0.008 [μ m]
 14 XL=-0.210 YL= 0.001 XR=-0.043 YR= 0.008 [μ m]
 15 XL=-0.208 YL= 0.000 XR=-0.039 YR= 0.007 [μ m]
 16 XL=-0.209 YL= 0.001 XR=-0.040 YR= 0.007 [μ m]
 17 XL=-0.206 YL= 0.001 XR=-0.039 YR= 0.008 [μ m]
 18 XL=-0.209 YL= 0.001 XR=-0.042 YR= 0.008 [μ m]
 19 XL=-0.208 YL= 0.001 XR=-0.040 YR= 0.007 [μ m]
 20 XL=-0.206 YL= 0.001 XR=-0.038 YR= 0.007 [μ m]
 21 XL=-0.209 YL= 0.001 XR=-0.040 YR= 0.007 [μ m]
 22 XL=-0.207 YL= 0.001 XR=-0.038 YR= 0.007 [μ m]
 23 XL=-0.207 YL= 0.001 XR=-0.039 YR= 0.007 [μ m]
 24 XL=-0.205 YL= 0.001 XR=-0.038 YR= 0.007 [μ m]
 25 XL=-0.209 YL= 0.001 XR=-0.040 YR= 0.007 [μ m]

EFFICIENT DATA COUNT: 25

MAX: XL=-0.203 YL= 0.001 XR=-0.036 YR= 0.008 [μ m]

MIN: XL=-0.210 YL= 0.000 XR=-0.043 YR= 0.007 [μ m]

RANGE: XL= 0.007 YL= 0.001 XR= 0.007 YR= 0.001 [μ m]

AVERAGE: XL=-0.207 YL= 0.001 XR=-0.040 YR= 0.008 [μ m]

3-SIGMA: XL= 0.005 YL=0.001 XR=0.005 YR= 0.001 [μ m]

MODEL	FPA-3000 i4	ITEM	RETICLE ROTATION ACCUARACY/REPEATABILITY		
SN		ENGR	Cut	SPEC	Accuracy $\leq \pm 0.01$ Repeatably $\leq \pm 0.02$
CUSTOMER		DATE			

	AVE	1	2	3	4	5
Y1	0.009	0.019	0.019	-0.004	0.003	x
Y2	-0.001	x	0.018	0.000	-0.020	-0.022
Y3	0.005	0.025	0.000	-0.022	0.015	x
Y4	-0.007	x	-0.005	0.005	-0.021	0.003
Y5	0.002	0.014	0.001	0.014	-0.022	x
Y	0.002					

Accuracy: **0.001** [um]
Repeatability: **0.008** [um]

MODEL	FPA-3000 i4	ITEM	B/C SCOPE DEFOCUS CHARACTERISTICS		
SN		ENGR	Cut	SPEC	Ka,Kb,Kc < 0 ± 20mrad
CUSTOMER		DATE			

B scope

10	Ka	0	0	0	-10
10	Kb	0	0	0	-5
10	Kc	0	0	0	2

<<< AA defocus characteristic >>>

N	K	Xl	Yl	Xr	Yr
Total	Z = -3.00	-99999	-99999	388	195
Total	Z = 0.00	-99999	-99999	388	163
Total	Z = 3.00	-99999	-99999	388	145
Total	Ka	0	0	0	-10
Total	Kb	0	0	0	-5
Total	Kc	0	0	0	2

$$Ka = (TOCz - TOCm) / 3$$

$$Kb = (TOCp - TOCz) / 3$$

$$Kc = (TOCm + TOCp - 2TOCz) / 6$$

C scope

10	Ka	0	0	0	0
10	Kb	0	0	-1	0
10	Kc	0	0	-1	0

<<< AA defocus characteristic >>>

N	K	Xl	Yl	Xr	Yr
Total	Z = -3.00	-99999	-99999	393	146
Total	Z = 0.00	-99999	-99999	398	146
Total	Z = 3.00	-99999	-99999	391	146
Total	Ka	0	0	1	0
Total	Kb	0	0	-2	0
Total	Kc	0	0	-2	0

$$Ka = (TOCz - TOCm) / 3$$

$$Kb = (TOCp - TOCz) / 3$$

$$Kc = (TOCm + TOCp - 2TOCz) / 6$$

MODEL	FPA-3000 i4	ITEM	SCOPE TOC MEASUREMENT REPEATABILITY		
SN		ENGR	Cut	SPEC	3σ ≤ 0.02um
CUSTOMER		DATE			

	X	Y	
1	0.368	-0.016	[um]
2	0.371	-0.024	[um]
3	0.374	-0.016	[um]
4	0.374	-0.017	[um]
5	0.366	-0.016	[um]
6	0.364	-0.024	[um]
7	0.371	-0.015	[um]
8	0.368	-0.03	[um]
9	0.37	-0.032	[um]
10	0.365	-0.022	[um]
11	0.369	-0.018	[um]
12	0.369	-0.02	[um]
13	0.375	-0.03	[um]
14	0.367	-0.021	[um]
15	0.363	-0.021	[um]
16	0.37	-0.019	[um]
17	0.367	-0.023	[um]
18	0.375	-0.029	[um]
19	0.38	-0.021	[um]
20	0.38	-0.028	[um]
21	0.381	-0.022	[um]
22	0.37	-0.028	[um]
23	0.367	-0.021	[um]
24	0.372	-0.019	[um]
25	0.371	-0.014	[um]
MAX ;	0.381	-0.014	[um]
MIN ;	0.363	-0.032	[um]
RANGE ;	0.018	0.018	[um]
AVERAGE	0.371	-0.022	[um]
3-SIGMA	0.014	0.015	[um]

MODEL	FPA-3000 i4	ITEM	BLCC STABILITY (MODE 1)		
SN		ENGR	Cut	SPEC	X&Y $3\sigma \leq 0.030\mu\text{m}$ Range $\leq 0.03\mu\text{m}$
CUSTOMER		DATE			

1	BIX = 0.027	BIY = -0.005 [um]
2	BIX = 0.027	BIY = -0.003 [um]
3	BIX = 0.034	BIY = -0.005 [um]
4	BIX = 0.028	BIY = -0.004 [um]
5	BIX = 0.027	BIY = 0.004 [um]
6	BIX = 0.031	BIY = 0.001 [um]
7	BIX = 0.027	BIY = -0.004 [um]
8	BIX = 0.034	BIY = -0.000 [um]
9	BIX = 0.030	BIY = 0.000 [um]
10	BIX = 0.023	BIY = -0.004 [um]
11	BIX = 0.024	BIY = 0.002 [um]
12	BIX = 0.028	BIY = -0.003 [um]
13	BIX = 0.028	BIY = -0.003 [um]
14	BIX = 0.029	BIY = -0.000 [um]
15	BIX = 0.027	BIY = -0.001 [um]
16	BIX = 0.030	BIY = -0.002 [um]
17	BIX = 0.026	BIY = -0.002 [um]
18	BIX = 0.025	BIY = -0.002 [um]
19	BIX = 0.023	BIY = -0.001 [um]
20	BIX = 0.022	BIY = -0.004 [um]
21	BIX = 0.024	BIY = -0.001 [um]
22	BIX = 0.030	BIY = 0.000 [um]
23	BIX = 0.024	BIY = -0.005 [um]
24	BIX = 0.026	BIY = 0.000 [um]
25	BIX = 0.027	BIY = -0.001 [um]

Available Data 25 Illumination Mode 1

Mean :	BIX = 0.027	BIY = -0.002 [um]
3Sigma :	BIX = 0.009	BIY = 0.007 [um]
Max :	BIX = 0.034	BIY = 0.004 [um]
Min :	BIX = 0.022	BIY = -0.005 [um]
Range :	BIX = 0.012	BIY = 0.010 [um]

MODEL	FPA-3000 i4	ITEM	BLCC STABILITY (MODE 3)		
SN		ENGR	Cut	SPEC	X&Y $3\sigma \leq 0.030\mu\text{m}$ Range $\leq 0.03\mu\text{m}$
CUSTOMER		DATE			

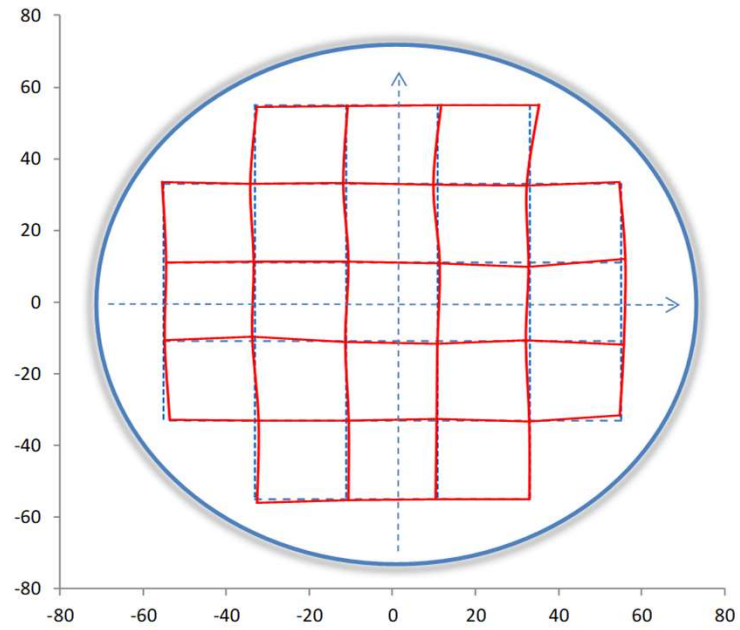
1	BIX = 0.023	BIY = -0.003 [um]
2	BIX = 0.021	BIY = -0.002 [um]
3	BIX = 0.024	BIY = 0.000 [um]
4	BIX = 0.025	BIY = -0.006 [um]
5	BIX = 0.021	BIY = -0.002 [um]
6	BIX = 0.026	BIY = -0.003 [um]
7	BIX = 0.025	BIY = -0.004 [um]
8	BIX = 0.025	BIY = -0.003 [um]
9	BIX = 0.027	BIY = -0.004 [um]
10	BIX = 0.027	BIY = -0.003 [um]
11	BIX = 0.027	BIY = -0.000 [um]
12	BIX = 0.025	BIY = -0.003 [um]
13	BIX = 0.023	BIY = 0.000 [um]
14	BIX = 0.025	BIY = -0.005 [um]
15	BIX = 0.022	BIY = 0.002 [um]
16	BIX = 0.023	BIY = -0.004 [um]
17	BIX = 0.023	BIY = -0.002 [um]
18	BIX = 0.024	BIY = -0.001 [um]
19	BIX = 0.025	BIY = -0.007 [um]
20	BIX = 0.026	BIY = -0.004 [um]
21	BIX = 0.024	BIY = -0.006 [um]
22	BIX = 0.023	BIY = -0.004 [um]
23	BIX = 0.025	BIY = -0.002 [um]
24	BIX = 0.029	BIY = -0.005 [um]
25	BIX = 0.026	BIY = -0.005 [um]

Available Data 25 Illumination Mode 3

Mean :	BIX = 0.025	BIY = -0.003 [um]
3Sigma :	BIX = 0.006	BIY = 0.006 [um]
Max :	BIX = 0.029	BIY = 0.002 [um]
Min :	BIX = 0.021	BIY = -0.007 [um]
Range :	BIX = 0.008	BIY = 0.009 [um]

MODEL	FPA-3000 i4	ITEM	AGA ACCURACY MODE 1		
SN		ENGR	Cut	SPEC	mean + 3s < 0.06um
CUSTOMER		DATE			

SHIFT X = -4.13 nm
 SHIFT Y = 6.06 nm
 WMAG X = -0.22 ppm
 WMAG Y = 0.40 ppm
 WROT X = -0.10 pppm
 WROT Y = 0.17 ppm
 3σ X = 37.17 nm
 3σ Y = 47.00 nm
 X(|m|+3σ) = 41.30 nm
 Y(|m|+3σ) = 53.07 nm
 RES 3σX = 22.73 nm
 RES 3σY = 17.38 nm



XREG

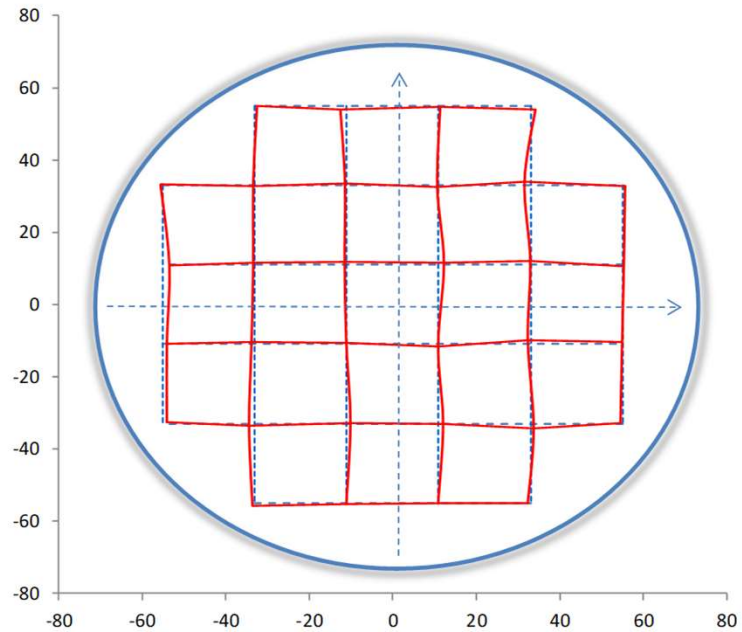
	1	2	3	4	5	6
1		-3	-9	-9	2	
2	-2	-15	-16	-24	-24	-26
3	11	-3	0	-5	-16	-8
4	11	-3	-4	-7	-19	-8
5	27	16	8	-5	-7	-14
6		16	11	-4	-3	

YREG

	1	2	3	4	5	6
1		25	27	26	25	
2	30	23	22	16	11	18
3	16	16	15	7	-4	16
4	11	19	1	-7	2	-13
5	-1	-5	-7	-5	-14	0
6		-22	-17	-18	-19	

MODEL	FPA-3000 i4	ITEM	AGA ACCURACY MODE 3		
SN		ENGR	Cut	SPEC	mean + 3s < 0.06um
CUSTOMER		DATE	8/16/2023		

SHIFT X = -16.41 nm
 SHIFT Y = 1.84 nm
 WMAG X = 0.05 ppm
 WMAG Y = 0.06 ppm
 WROT X = -0.03 ppm
 WROT Y = -0.09 ppm
 3σ X = 26.48 nm
 3σ Y = 19.52 nm
 X(|m|+3σ) = 42.89 nm
 Y(|m|+3σ) = 21.36 nm
 RES 3σX = 24.08 nm
 RES 3σY = 18.36 nm



XREG

	1	2	3	4	5	6
1		-8	-27	-7	2	
2	-22	-19	-18	-16	-26	-4
3	-3	-21	-21	-2	-14	-9
4	-11	-27	-19	-18	-22	-15
5	-13	-35	-11	-8	-10	-21
6		-29	-23	-22	-26	

YREG

	1	2	3	4	5	6
1		5	-5	2	-6	
2	7	3	8	-1	13	0
3	2	8	10	7	11	-3
4	3	8	6	-6	12	5
5	5	-5	3	-1	-15	0
6		-8	-4	-3	-2	

MODEL	FPA-3000 i4	ITEM	MECHANICAL PA ACURACY		
SN		ENGR	Cut	SPEC	XI,Xr,YI,Yr 3s ≤ 40um
CUSTOMER		DATE			

MpaHelp Ktermlog.01660

```

=====x|=====
Sample count = 25
AVERAGE = -937270.375
3-SIGMA = 15723.496          15.7 um
=====xr=====
Sample count = 25
AVERAGE = -781222.875
3-SIGMA = 17681.275          17.7 um
=====y|=====
Sample count = 25
AVERAGE = 144039.516
3-SIGMA = 18270.531          18.3 um
=====yr=====
Sample count = 25
AVERAGE = -624479.812
3-SIGMA = 17115.320          17.1 um
=====END=====
i4hp_user[24]

```

MODEL	FPA-3000 i4	ITEM	THROUGHPUT DxD ON		
SN		ENGR	Cut	SPEC	≥ 70
CUSTOMER		DATE			

```

Date           : Aug 14, '23 14:58:38
Machine        : FPA-3000 i4 ALSI01
Job Name       : /6-inch_vortex/AGA-2ND.job
Tilt Compensation Mode : Die by Die

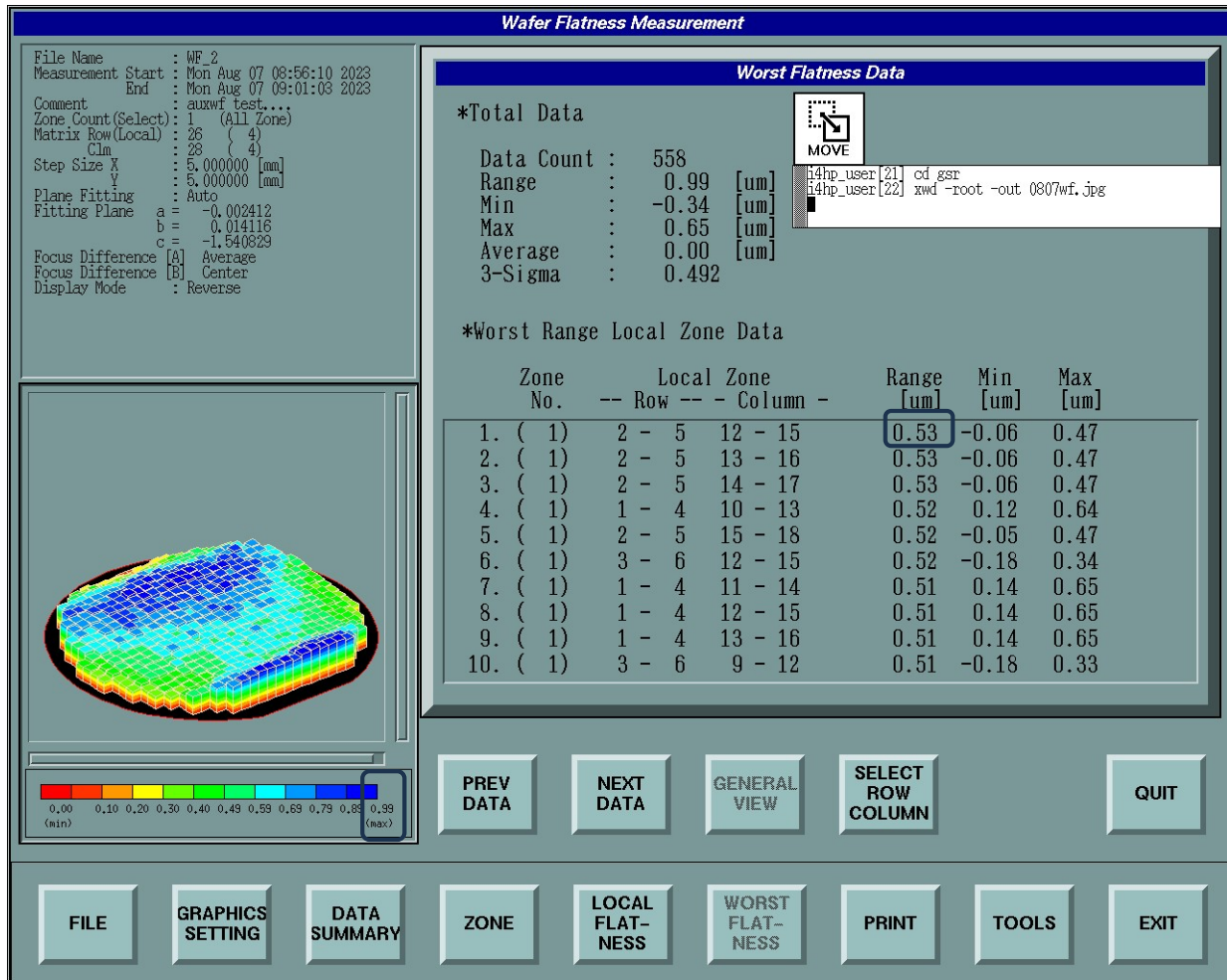
wno - uload_wafer load_wafer tv_pre_align  aga  index [ms]  throughput [WPH]
1,      3895,      21084,      6345,      49774,      103993,
2,      3896,      6341,      6568,      7896,      47036,
3,      3903,      6294,      6427,      7859,      46699,
4,      3899,      6336,      6533,      4061,      43186,
5,      3913,      6309,      6347,      4136,      43156,
(SUMMARY)
      uload_wafer load_wafer tv_pre_align  aga  index [ms]  throughput [WPH]
ave.      3902,      6320,      6468,      5988,      45019,      80.0

wno 1st-step  step #####  sfend  sf_posi  focus  expo  shot [ms]
2,  444 ,  385.8,  0.0,  356.1,  108.0,  72.5,  310.4,  696.3
3,  445 ,  382.3,  0.0,  354.4,  105.5,  74.8,  310.1,  692.4
4,  443 ,  387.1,  0.0,  356.6,  107.9,  72.2,  309.9,  697.0
5,  453 ,  389.5,  0.0,  359.6,  110.9,  75.6,  310.1,  699.7
ave. 446.2,  386.2,  0.0,  356.7,  108.1,  73.8,  310.1,  696.3
i4>

```

TPD AVG: 80.1 WPH

MODEL	FPA-3000 i4	ITEM	WAFER CHUCK FLATNESS		
SN		ENGR	Cut	SPEC	TTV ≤ 2.0um LTV ≤ 0.6um
CUSTOMER		DATE			



MODEL	FPA-3000 i4	ITEM	Wafer Transfer		
SN		ENGR	Cut	SPEC	No Error
CUSTOMER		DATE	8/11/2023		

Sequence: 001E: Start Awaiting
Inline: OFFLIN
Wafer: 500
Warning: 2000-1-1F-0 Wafer feeding unit main/Norma
Open Frame Command: OFF

WARNING

DECORATION

diameter = 150.00±2.50 mm
column
1 2 3 4 5 6
1 2 3 4 5 6
12 11 10 9 8 7
13 14 15 16 17 18
22 21 20 19
23 24
orientation flat = 57.50±2.50 mm
orientation flat angle = 0.00 degree

MOVE

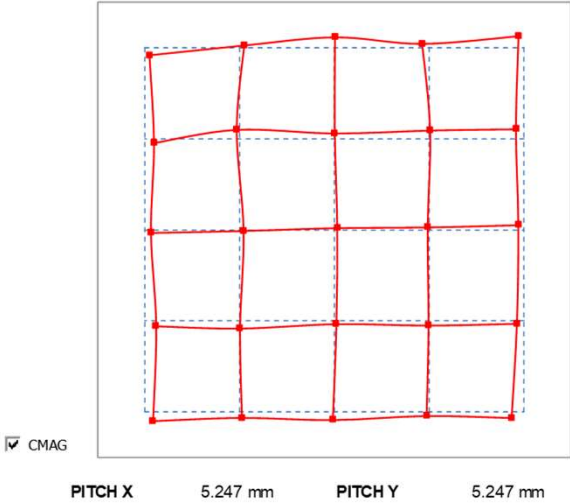
Job Name
/6-inch_ventex/AGA-1ST_22.job
Reticle ID
/canon/default.rf
Number of Wafer
-1
Sequence Mode
1st
Focus Offset
0.00 um
Alignment Mode
Carib.[i-line]
Exposure Dose
0.0 J/m2

Guide:

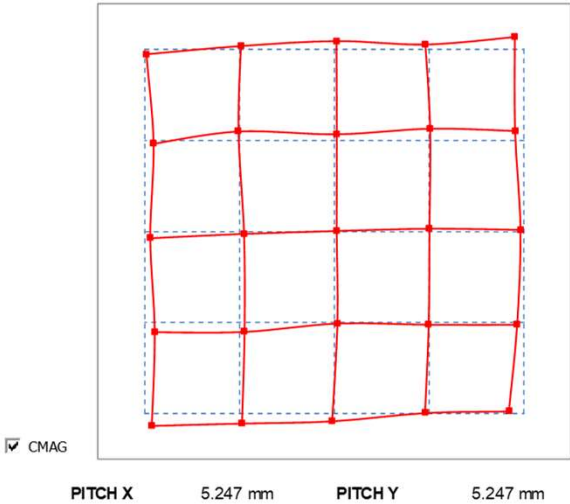
START RETICLE ALIGN Joystick RA TOOLS COM-MAND EXIT

14hp_user[21] cd gsr
14hp_user[22] xwd -root -out running500.jpg

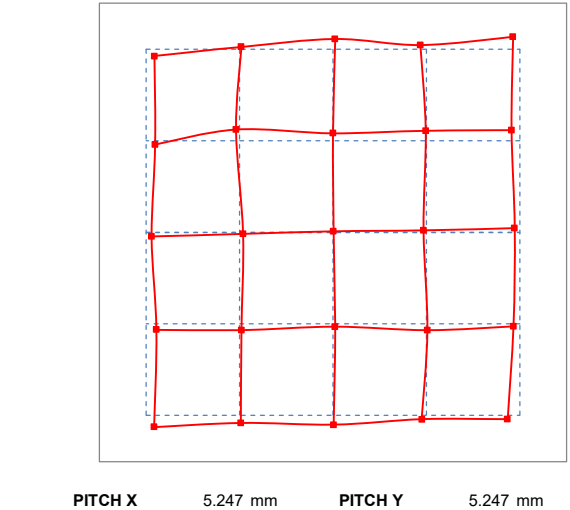
MODEL	FPA-3000 i4	ITEM	Exposure History		
SN		ENGR	Cut	SPEC	Focus Range $\leq 0.4 \mu\text{m}$ Mag Range $\leq 2 \text{ ppm}$
CUSTOMER		DATE			



Condition	Before Heating
Focus	-0.15
Mag	-10.501



Condition	After Heating
Focus	-0.125
Mag	-10.935



Condition	After Cooling
Focus	-0.05
Mag	-11.039

The Results	
Focus Range	0.10
Mag Range	0.5